

CLAIMS

1. An optical head device comprising:

a light source;

focusing means which focuses light from the light source onto a desired data layer of an optical recording medium having multiple data layers;

wavefront converting means provided between the light source and the focusing means;

aberration detecting means which detects an aberration amount of a spot of the focus light on the desired data layer; and

output controlling means which controls output of the light source, wherein

the wavefront converting means is driven in such a manner as to reduce the aberration amount detected by the aberration detecting means, and

the output controlling means holds learned data as to a relation between a driving amount to be inputted to the wavefront converting means and the output of the light source, and controls the output of the light source based on the driving amount to be inputted to the wavefront converting means and the learned data, the driving amount being changed depending on the aberration of the focus light spot.

2. The optical head device according to Claim 1, further comprising driving amount detecting means which detects the driving amount to be inputted to the wavefront converting means, wherein the output controlling means controls the output of the light source based on the driving amount detected by the driving amount detecting means.

3. The optical head device according to Claim 1 or 2, wherein the output controlling means controls the output of the light source based on the product of a direct current component and an alternate current component of the driving amount to be inputted to the wavefront converting means.

4. The optical head device according to any one of Claims 1 through 3, wherein the wavefront converting means is a liquid crystal device.

5. The optical head device according to any one of Claims 1 through 4, wherein the wavefront converting means includes a plurality of lenses, and lens driving means which drives one of the plurality of lenses to change a distance between the one lens and the other one of the plurality of lenses, and the lens driving means is driven in such a manner as to reduce the aberration amount detected by the aberration detecting means.

6. The optical head device according to any one of Claims 1 through 5, wherein the output controlling means controls the output of the light source based on the driving amount and the learned data so as to compensate for a spherical aberration of the order higher than a highest order of aberration compensatable by the wavefront converting means.

7. An optical recording device comprising:
the optical head device of any one of Claims 1 through 6; and
rotation driving means which rotates the optical recording medium.

8. An optical recording method for recording information on an optical recording medium having multiple data layers with use of a focus light spot emitted from a light source, the method comprising the steps of:

learning in advance a relation between a driving amount by which wavefront converting means is to be operated so as to reduce an aberration of the focus light spot, and an output of the light source;

detecting the aberration of the focus light spot;

driving the wavefront converting means so as to reduce the aberration;

and

controlling the output of the light source based on the driving amount of the wavefront converting means.